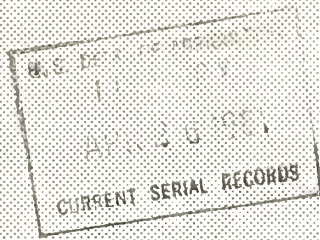


Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

984m
p.3



Class III Milk in the New York Milkshed V- Processors' Decisions on Utilization

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
MARKETING ECONOMICS RESEARCH DIVISION

CONTENTS

	Page
Summary	4
Introduction.	5
Responses of output to changes in margins, 1948-57	7
Effect of supply of Class III milk	7
Correlation of outputs with margins	8
Changes at individual plants	9
Relationship of usage of ingredients of ice cream mix to price.	14
Survey of individual firms	16
Interest in different classes of use	17
Sales areas of processors and users	18
Principal type of distribution for Class III products	19
Processors' preferences among Class III products	19
Sales Commitments	21
Commitments for milk supplies	23
Commitments by users.	24
Labor supply	24
Health approvals	25
Pool status	25
Competition from outside the milkshed	26
Anticipated responses to higher Class III prices	26
Implications of the survey results	27
Literature cited	28

Washington, D. C.

March 1961

PREFACE

This report is one of a group dealing with Class III milk pricing in the New York-New Jersey milkshed. Particular emphasis is given to factors affecting the market for Class III products and to the decisions which handlers make about the form in which they will dispose of Class III milk. The project under which this group of publications has been developed was carried out by the Marketing Economics Research Division, Agricultural Marketing Service. A substantial part of the cost was financed by a grant from the New York-New Jersey Milk Market Administrator.

This report deals with the extent to which changes in output of the major products of Class III milk were associated with changes in margins for these products in the 5 or 10 years ending with 1957. It also covers the results of interviews with officials of many of the firms that handled Class III milk. During these interviews, the officials were asked about the considerations that affected their decisions on how they use this milk. The questions concerned such topics as each firm's preferences among the products it was equipped to produce and limitations on the extent to which the firm could adjust its output to take advantage of shifts in profitability among products.

Previous reports in this group were:

Class III Milk in the New York Milkshed:

- I Manufacturing Operations. Marketing Research Report No. 379.
- II An Economic Description of the Industry. Marketing Research Report No. 396.
- III Costs of Manufacturing Dairy Products. Marketing Research Report No. 400.
- IV Processing Margins in Manufacturing Dairy Products. Marketing Research Report No. 419.

We hope to issue a concluding report on economic aspects of pricing Class III milk.

The work on which the reports are based was done by a research team composed of Donald B. Agnew, F. W. Cobb, Jr., C. E. McAllister, and T. R. Owens, under the general supervision of D. A. Clarke, Jr. (on leave from the University of California). Additional assistance was obtained from Irving Dubov (on leave from the University of Tennessee).

The cooperation of representatives of the dairy industry, as well as members of the various regulatory agencies, is gratefully acknowledged. R. G. Bressler, Professor of Agricultural Economics, University of California, and consultant to the Marketing Economics Research Division, contributed substantially to the analysis of the problem with which the study deals, and to the planning of the work. His article, "Pricing Raw Product in Complex Milk Markets," (item 1 in Literature Cited, page 28) embodies a part of this contribution.

SUMMARY

Firms manufacturing dairy products from Class III milk in the New York-New Jersey milkshed varied their output with changes in the net margins realized from different products, but net margins accounted for a relatively small part of the total variations in output. Manufacturers' decisions on products to be produced were influenced by many factors other than margins. Chief among these were difficulties in finding outlets for products they might want to produce in larger quantities. Most firms preferred ice cream, ice cream mix, or ingredients for ice cream mix over other products for increased output. Similarly, manufacturers of ice cream mix varied their selection of ingredients somewhat in response to changes in price, but appeared to be influenced strongly by other considerations.

These findings were based on statistical analyses of data on production and prices of products made from Class III milk in the New York-New Jersey milkshed and on information obtained in interviews with officials of dairy firms.

Correlations between changes in output and changes in net margins were quite low for most products, but most were significantly different from zero, by statistical tests. Thus, for each of the products, a decrease in the net margin would be expected to result in a perceptible decrease in output of that product in the milkshed. Output data of 128 individual plants were analyzed for months in which margins rose or fell by substantial amounts. Many plants behaved as though they were insensitive to the change in margin, or were influenced by other considerations. The small degree of consistency in plants' output responses agrees with the low coefficients found in the correlation analysis.

Manufacturers of ice cream mix tended to shift from one ingredient to another as price relationships changed. Ingredients supplying fat were affected more by price than were ingredients supplying solids-not-fat. Usage of ingredients was more closely related to the cost of fat in plants in upstate New York than in plants in New York City.

Thirty firms processing Class III milk and eight firms using Class III products in ice cream and candy were interviewed. The purpose of the interviews was to obtain information about the way in which decisions on the utilization of Class III milk are made, and about factors which influence the decisions. One such influential factor was that many of the firms processing Class III milk operated over a broader area than the New York-New Jersey milkshed, either producing or selling, or both, in other areas. Some coupled their Class III operations with the handling of Class I and Class II milk (milk and cream for fluid use in the metropolitan district). Such diversification of interest would tend to make processors more responsive to changes in the price of Class III milk under the New York-New Jersey order.

Other factors having a possible bearing on these firms' responses to changes in the price of Class III milk include their preferences among Class III products; their commitments to producers for supplies of milk and to buyers of their products; and such circumstances as the supply of labor, multiplicity of health approvals, and whether a plant is a pool plant or not. These factors tend to delay or dampen the processor's responses to changes in margins.

CLASS III MILK IN THE NEW YORK MILKSHED

V. PROCESSORS' DECISIONS ON UTILIZATION

By Louis F. Herrmann, Donald B. Agnew, and D. A. Clarke, Jr., 1/
Marketing Economics Research Division, Agricultural Marketing Service

INTRODUCTION

In recent years some 10 billion pounds of milk has been marketed annually in the New York-New Jersey milk marketing area. This milk is subject to price regulation under Federal Milk Marketing Order No. 27 and concurrent orders issued by the States of New York and New Jersey. The orders establish prices to be paid by milk handlers for the milk they purchase from farmers, different prices being established for milk for different classes of use. This report presents information about that part of the supply which is used for manufactured dairy products (Class III milk), about 3 1/2 billion pounds annually.

The principal products of Class III milk are cream for manufacturing and for fluid uses outside the metropolitan district, ice cream, condensed and evaporated milk, butter, and Cheddar cheese. Cobb and Clarke (3) have described in detail the nature of Class III manufacturing operations in the milkshed: The types of products manufactured, regional production patterns, and the relation of output to manufacturing capacity. 2/

The complex structure of firms and plants in the New York-New Jersey Class III milk industry should be expected to influence the effects which a change in Class III pricing may have on the market. Firms differ in size, and in the relation of their Class III operations to their other operations. Plants in the milkshed differ in whether they are directly regulated under the order (pool plants) 3/ or whether they only process milk purchased from regulated plants, and they differ in the kinds of activities they carry on. Clarke, McAllister, and Agnew (2) described these and other aspects of the industry in an earlier report of this group.

Some of the dairy firms in the New York-New Jersey milkshed confine their activities exclusively to the city distribution of fluid milk. They procure their supplies of milk from country plants operated by other firms. Some of these country plants have no city milk distribution, but supply milk to other plants on either long-time or spot sales arrangements. Country plants may also engage in manufacturing. Finally, some firms do nothing but manufacture dairy products from milk which, for a wide

1/ D. A. Clarke, Jr., is Professor of Agricultural Economics at the University of California, and was employed by the Agricultural Marketing Service while on leave from the University.

2/ Underscored numbers in parentheses refer to Literature Cited, p. 28.

3/ Pool plants are designated by the Secretary of Agriculture on the basis of requirements established in the New York-New Jersey orders. The milk received from producers by pool plants becomes pool milk.

variety of reasons, may be offered for sale by other dairy plants. A typical operation, within these possible combinations of functions would be a firm operating a city plant for bottling and distributing milk, the milk being supplied by a country plant owned by the same firm. The country plant would procure milk from enough producers in the low month of the year to supply bottling needs plus some for the manufacture of certain preferred products; the plant would carry on some manufacture during the season of low production to assure or maintain access to markets for the preferred products.

The decisions which manufacturing plants make about how they will use their Class III milk are influenced fundamentally by profits. Luke (4, pp. 121-122) studied gross margins and production of manufactured products under the New York order for the period 1940-48 and concluded that the proportions of surplus milk used for a number of these products responded quickly to changes in margins.

Changes in output of a product may lead, rather than follow, a change in margin for the product. If output of the product were influenced primarily by the supply of milk, for example, an increase in supply might depress the price of the product. Hence, margins and output would move in opposite directions.

Some of the earlier reports in this group gave estimates of net margins as an approximation of the profits from manufacturing the various dairy products. Owens (7) estimated costs of processing milk into 11 different products or pairs of products for 1958. His estimates included processing costs, but not some selling and administrative charges. McAllister (5) extended the cost estimates to cover the years 1948-57 and calculated partial net margins for the same products. During the 10 years 1948-57, the margins for each product or combination tended to fluctuate around a particular level. Thus, margins for Cheddar cheese and for butter and manufacturing cream in conjunction with spray process nonfat dry milk tended to be comparable and were relatively low. Margins for combinations including condensed skim milk and cottage cheese were higher than for combinations in which the skim milk was made into nonfat dry milk. The widest margins were for milk made into ice cream mix and cottage cheese.

Such differences in apparent profitability among products should have led manufacturers to increase the output of the more profitable items. Shifts in supplies should have tended to reduce selling prices and equalize margins. That these shifts did not occur may indicate the strength of other factors acting to prevent such adjustments.

The major objective of the study reported here was to analyze the responsiveness of manufacturers to changes in the relative profitability of Class III products. Changes in total market use of milk in each of the major Class III products were analyzed by statistical methods in relation to changes in the respective margins and in the total supply of Class III milk. Also, production records of individual companies were studied to determine if some firms responded more quickly to changes in price relationships than did others.

This report is also concerned with the decisions of ice cream manufacturers and some other users of Class III products who can use materials from nonpool sources or alternative intermediate products made from Class III milk. The actions of such users might affect manufacturers' decisions about the form in which they would use Class III milk. If the users turn to nonpool sources, manufacturers in the pool may choose to reduce their purchases of milk from producers.

Most firms processing Class III milk produced a diversified line of products (2, p. 20). Proportions of the different products tended to remain within fixed limits.

Yet, a calculation of net revenues will show that a plant gains from diverting its entire milk supply to the advantageous product (1, p. 121). In this study, an important objective was to find out the factors that affect the rate and extent of the shifting that does occur. This information was obtained by interviewing responsible officials in a substantial number of the firms operating plants in the New York-New Jersey milkshed.

In brief, this is a report about the activities of firms processing or using the products of Class III milk in the New York-New Jersey milkshed, how they responded to changes in price, and what factors they consider in deciding whether to change their output of the various products.

RESPONSES OF OUTPUT TO CHANGES IN MARGINS, 1948-57

The margins used in measuring responses of output were the "partial net margins" for the 10 years 1948-57, by months, published in an earlier report (5). These margins were calculated from three components: (1) Gross value of the products from 100 pounds of milk based on wholesale selling prices; (2) raw product cost, based on the Class III price established under Federal Order 27; and (3) processing and packaging costs. The partial net margin was found by subtracting from the gross value the raw product and other costs. The result, while not exactly synonymous with profits, does indicate the relative profitability of manufacturing alternative types of dairy products.

The data on margins covered Cheddar cheese, "spot milk," and nine combinations of products each consisting of butter, cream, or ice cream mix with nonfat dry milk, condensed skim milk, or creamed cottage cheese.

Outputs of Class III products were the quantities produced by pool plants, in terms of the milk used, and were taken from records of the New York Milk Market Administrator.

The data on margins and output fluctuated seasonally, and they rose and fell over longer periods in movements that could be called trends or cycles. Seasonal changes were expected, and manufacturers discounted their effects in advance. This was shown, for instance, by the basis on which the manufacturers negotiated contracts for seasonal supplies of Class III milk (see page 23). Plant managers probably recognized the cyclical or trend movements in output or in margins, also, and made their longer run decisions accordingly. Thus, the month-to-month changes to which they responded were those remaining after allowing for seasonal patterns and trends. For the purpose of this study, the seasonal, trend-cycle, and irregular components of the original data were separated, using a method developed by the U. S. Bureau of the Census (8). The following correlations were based on the irregular components of each series; that is, on output and margins data adjusted to remove seasonal and trend-cycle components.

Effect of Supply of Class III Milk

The relation of output of Class III products to changes in margins was measured by statistical methods applied in a way that allowed for the effect of changes in the total quantity of Class III milk. The supply of Class III milk accounted for several times as much of the variation in output of the individual products as did the margins. The coefficients of simple correlation of output with Class III supply ranged from

0.06 to 0.61, while the coefficients of partial correlation of output with margins ranged from 0 to 0.31.

Relation between total supply of Class III milk and output of
specified products, New York pool, 1948-57

<u>Product</u>	<u>Coefficient of simple correlation</u>
Cream	0.06
Frozen desserts and homogenized mixes	
Sold in New York City	.38
Sold outside New York City	.30
Butter	.57
Cheddar cheese	.61

Correlation of Outputs With Margins

The partial correlation of outputs with margins, when changes in total Class III usage were allowed for, varied for the different products. For cream, the coefficients ranged from 0.16 to 0.18; for ice cream mix sold to upstate New York and New Jersey outlets, -0.19 to -0.26; butter, -0.19 to -0.31; and cheese, 0.

These coefficients (except for cheese) range from barely significant to highly significant, judged statistically. The probabilities that they would occur by chance in a sample drawn from a universe in which the true correlation is zero are indicated in table 1.

The average amounts of change in output that occurred with a 10-percent change in margin also are shown in the table. These figures provide a basis for estimating the short-run change in output that would follow a change in the margin for one product (or product combination) relative to other products.

The positive correlations for cream and ice cream mix sold in New York City show that output of these products increased as the margin increased. Output of ice cream mix for upstate New York and New Jersey outlets declined as margins for ice cream mix widened. This is explainable if some of the increase in sales to New York City was supplied by diverting the product from upstate New York or New Jersey buyers, rather than by increasing the total output.

The negative relation of butter output to butter margins probably reflects the residual role of butter. This role, of course, resulted in a rise in output during the season when, owing largely to the increased proportions of milk from feeder plants, costs rose and margins declined, an effect which should have been accounted for by the seasonal adjustments applied to the data. That there remains a negative correlation in the irregular component suggests that fluctuations in output of butter in New York tend to cause, rather than to result from, changes in this component of the margin. The New York butter market is known to be less stable than the Chicago market (6). Sensitivity to local supplies may account for some of this instability.

Table 1.--Relation of change in output of specified combinations of dairy products to change in margins, New York-New Jersey market, 1948-57

Product	Coefficient of partial correlation for product combined with--			Change in output accompanying 10-percent change in margin for product combined with--		
	Nonfat dry milk	Condensed skim milk	Creamed cottage cheese	Nonfat dry milk	Condensed skim milk	Creamed cottage cheese
				Percent	Percent	Percent
Cream	.16	.18	.18	0.6	1.4	2.0
Ice cream mix:						
Sold in New						
York City .	<u>1/</u> .27	.18	<u>2/</u> .19	2.6	2.4	2.7
Sold in						
upstate						
New York .	<u>2/</u> -.19	<u>2/</u> -.20	<u>1/</u> -.26	- 3.3	- 4.8	- 7.2
Butter	<u>2/</u> -.19	<u>1/</u> -.31	<u>1/</u> -.31	-15.4	-27.7	-32.8
Cheese	0	---	---	0	---	---

1/ The probability that a correlation coefficient of this size would occur in a sample from a universe in which the true correlation is zero is approximately 0.01 or less, based on Fisher's Z Test.

2/ The probability that a correlation coefficient of this size would occur in a sample from a universe in which the true correlation is zero is approximately 0.05 to 0.01.

That cheese output showed no correlation with month-to-month changes in margins is consistent with some of the information obtained in other phases of this project. Cheddar cheese plants were among the few plants which lacked equipment for more than one product (2). Cheddar cheese, also, was among the products subject to some form of sales commitment (see page 23), and some of the Cheddar cheese plants obtained supplies of milk under contracts or commitments which precluded the cheese manufacturer from adjusting output within a season.

Changes at Individual Plants

It was thought that some plants might be more sensitive to changes in margins than others and that the change in output at such plants would be quite conspicuous in months when margins changed appreciably, even though the average response of all plants in the market was small. Therefore, the production data of 128 plants in the New York pool were examined individually for the period 1953-57. The 128 plants consisted of more than half of all pool manufacturing plants owned by handlers who had more than one manufacturing plant, and about one-sixth of the pool manufacturing plants owned by handlers having only one manufacturing plant.

Normal seasonal production patterns were determined for each product manufactured at each plant. The month-to-month change in the partial net margin (relative to the partial net margin for butter with nonfat dry milk) was calculated for each product or pair of products for each month. The months showing the 6 to 10 largest changes of margins in the 60-month period 1953-57 were selected for study. ^{4/}

For each plant, the change in output of selected products was classified for each of the months having a major change in the margin. When the margin increased, for example, it was noted whether output rose, relative to the "normal" pattern for that plant, changed only the normal seasonal amount, or declined. These three types of response are referred to in the following discussion as expected, normal, and unexpected, respectively.

The results did not permit classification of individual plants by their degree of sensitivity to changes in margins, because 6 to 10 responses for each plant proved to be too small a number for this purpose. The results did, however, provide a measure of sensitivity for different products, and for firms grouped by size of firm.

Adjustments in Output, by Product.--There were some striking differences among products. For example, 138 responses of individual plants to changes in the margin for ice cream mix were classified (the 138 responses being the number of months when margins changed times the number of plants producing ice cream mix at some time during the year). In nearly 60 percent of these instances production continued in a normal pattern. Only 12 percent of the adjustments were classified as "expected" (table 2). On the other hand, of 165 responses of output of butter only about 8 percent showed continuation of normal production. In 48 percent of the instances production changed as expected, and in 30 percent the change was unexpected. Changes in output of ice cream mix were independent of the change in margin, or influenced by other considerations in more than 80 percent of the instances.

Skim milk products (cottage cheese, condensed skim milk, and nonfat dry milk) were insensitive to changing margins in 60 percent to 75 percent of all instances. That is, either production continued normally or the plant discontinued production during the given month.

Production lines had been closed down and remained closed in months when margins rose as frequently as 25 percent of the time for ice cream mix, 23 percent for condensed skim milk, 17 percent for nonfat dry milk, 14 percent for butter, and 5 percent for cottage cheese.

The pronounced seasonality of the markets for ice cream mix and condensed skim milk was reflected in a high proportion of months when plants were closed (25 percent and 23 percent, respectively) during months when margins increased. Production of ice cream mix, cottage cheese, and nonfat dry milk seemed to be tailored closely to market commitments, because of the high frequency of continued normal production (58 percent, 65 percent, and 58 percent, respectively). Production of nonfat dry milk was insensitive to changing margins, possibly because of the lack of alternative outlets for residual supplies of skim milk, which were a relatively large proportion of the skim milk available for manufacture in the milkshed.

^{4/} The changes in margins relative to the margin for butter and nonfat dry milk were 10 cents or more for cream and 9 cents for ice cream mix (both with each of the three skim milk products); 5 cents for butter with cottage cheese and 3 cents with condensed milk; and 10 cents for Cheddar cheese.

Table 2.--Responses in output of specified products at selected plants in the New York-New Jersey market, by type of adjustment, 1953-57

Product	Type of response 1/				
	Change as	Change	Continued	Closed	Total
	expected	opposite to expected	normal production pattern	during month observed	responses
	Number 2/	Number 2/	Number 2/	Number 2/	Number 2/
Ice cream mix	16	7	80	35	138
Butter	79	50	13	23	165
Cottage cheese	49	30	169	12	260
Condensed skim milk . . .	87	104	193	114	498
Nonfat dry milk	96	95	440	132	763
Total	327	286	895	316	1,824
	Percent	Percent	Percent	Percent	Percent
Ice cream mix	12	5	58	25	100
Butter	48	30	8	14	100
Cottage cheese	19	12	65	5	100
Condensed skim milk . . .	18	21	39	23	100
Nonfat dry milk	13	12	58	17	100
Average	18	16	49	17	100

1/ Change in production from month to month was classed as expected when with a rise in margin there was a rise in output, greater than normal, seasonally, for the given plant, and vice versa; it was classed as unexpected when a rising margin was associated with a relative drop in output, and vice versa.

2/ Number of responses.

Butter led in frequency of both expected and opposite-to-expected changes in output. This further reflects the erratic pattern of butter production in the milkshed, a consequence of butter's residual role and the large proportion of the fat in Class III milk going to other uses.

Adjustments in Output, by Size of Firm.--The output responses were tabulated by size of firm so that the relations between size of firm and sensitivity to margins could be seen. There was little variation between firms of different sizes in the frequencies of adjustments of the different types when responses for all five products were combined (table 3). When responses for the two fat products and the three skim milk products were tabulated as two separate groups, there were some differences among the four size groups (tables 4 and 5).

Adjustments in output of butterfat products by the very large and the very small firms differed greatly from those made by the "other" firms with four or more plants and the firms with two or three manufacturing plants (table 4). The very small firms most frequently changed output in agreement with the change in margins and seldom closed during the month observed. The very large firms most frequently continued

Table 3.--Adjustments in output of five manufactured products combined, at selected plants in the New York-New Jersey market, by type of adjustment, 1953-57

Size of firm	Occasions when output--				Ratio of output adjustments to total opportunities for adjustment			
	Total adjustment opportunities		Changed as expected		Continued normal production pattern		Closed during month observed	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
4 or more manufacturing plants:								
Largest firms..	447		77	17	234	53	81	18
Other firms..	650		142	22	255	39	130	20
2 or 3 manufacturing plants..	401		60	15	226	56	47	12
Single manufacturing plants..	326		48	15	180	55	58	18
All firms..	1,824		327	18	895	51	316	17

Table 4.--Adjustments in output of ice cream mix and butter combined, at selected plants in the New York-New Jersey market, by type of adjustment, 1953-57

Size of firm	Occasions when output--				Ratio of output adjustments to total opportunities for adjustment			
	Total adjustment opportunities		Changed as expected		Continued normal production pattern		Closed during month observed	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
4 or more manufacturing plants:								
Largest firms..	65		13	20	26	40	16	25
Other firms..	99		35	36	27	27	21	21
2 or 3 manufacturing plants..	68		19	28	24	35	12	18
Single manufacturing plants..	71		28	39	16	23	9	13
All firms..	303		95	31	93	31	58	19

Table 5.--Adjustments in output of cottage cheese, condensed skim milk, and nonfat dry milk combined, at selected plants in the New York-New Jersey market, by type of adjustment, 1953-57

Size of firm	Total adjustment opportu- nities	Occasions when output--				Ratio of output adjustments to total opportunities for adjustment			
		Changed as expected		Continued normal production pattern		Changed as expected		Continued normal production pattern	
		Number	Number	Number	Number	Percent	Percent	Percent	Percent
4 or more manu- facturing plants:									
Largest firms..	382	64	45	208	65	17	12	54	17
Other firms ..	551	107	107	228	109	19	19	42	20
2 or 3 manufac- turing plants ..	333	41	55	202	35	12	16	62	10
Single manufac- turing plants ..	255	20	22	164	49	8	9	63	20
All firms...	1,521	232	229	802	258	15	15	53	17
									100

normal production, apparently disregarding changes in margins. But plants in this group also had the highest frequency of months when they were out of production.

When butter and ice cream mix were considered separately, the relationships between size of firm and type of response to margin became more pronounced. Continuing normal production was the most common pattern of ice cream mix output in each group of firms by size, but only the largest firms had any instances of continuing normal output of butter. Changes opposite to expected were low for ice cream mix and comparatively high for butter among all groups of firms by size.

The responses in output of all skim milk products combined were similar among the three groups of firms having two or more plants (table 5). The firms with only one manufacturing plant showed changes as expected and opposite to expected both at about half the rates of the larger firms. The lower rates of such adjustments were offset mainly by a higher frequency of continued normal production.

When the skim milk products were considered separately, the pattern of output of each product was essentially the same in all size groups.

The patterns of output at individual plants were at variance with the results of the correlation analysis (pp. 7 - 9) for some products, notably butter. This study did not try to reconcile the differences. It should be borne in mind that the analysis of individual firms did not take into account differences in the quantity of milk or in the amount of the deviation of output from expected, and that the analysis was based on the limited number of months when margins changed substantially.

RELATIONSHIP OF USAGE OF INGREDIENTS OF ICE CREAM MIX TO PRICE

Usage of ingredients in ice cream mix varied from year to year within relatively narrow limits (table 6). For various reasons, a change in price which made it profitable to use one ingredient in place of another resulted in substitution of the cheaper ingredient for the more expensive ingredient. Some firms were slow to react to a change in price relationships (see p. 24). Sales of ingredients took place over a range of prices. For example, when the average cost of fat in cream was higher than the average cost of fat in condensed whole milk, some buyers of cream might be buying fat for less than some buyers of condensed whole milk (5, pp. 10-14). Furthermore, a shift in usage would tend to affect the prices of the ingredients. How strongly, then, was usage correlated with price?

Among three major sources of fat, usage generally changed inversely when the cost of fat changed. Cream, for example, was used less when the cost of fat in cream rose relative to the cost of fat in butter or whole milk (table 7). The relationship was stronger between cream and butter than between cream and whole milk. At plants in New York City, a 1 percent rise in the cost per pound of fat in cream, relative to butter, was accompanied by a 9 percent drop in usage of cream.

Usage of whole milk in ice cream mix at New York City plants was an exception, in that it rose when the cost of fat in whole milk rose. (At upstate plants the usual, inverse, relationship prevailed.) But the usage of whole milk in New York City plants was very small. It supplied only 0.3 to 0.6 percent of the fat in ice cream mix between 1948 and 1957 at city plants, compared with 5.4 to 7.8 percent at upstate plants (table 6).

Plants in upstate New York apparently related their usage of ingredients more closely to the cost of fat than did plants in New York City.

Table 6.--Ingredients supplying butterfat and milk solids-not-fat: Percentages used in wholesale manufacture of ice cream mix, New York State, 1948-57

Ingredient and location of plants using it	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
BUTTERFAT INGREDIENTS										
Upstate plants:										
Liquid whole milk.....	6.3	7.8	7.6	6.4	6.2	6.1	5.9	5.7	5.4	6.5
Condensed whole milk.....	8.3	8.8	8.0	8.5	6.8	9.3	10.6	12.7	13.8	13.5
Total whole milk.....	14.6	16.6	15.6	14.9	13.0	15.4	16.5	18.4	19.2	20.0
Cream.....	57.8	73.4	71.3	71.0	72.7	79.6	78.0	76.2	72.1	72.8
Butter.....	27.3	9.7	12.9	13.7	12.8	4.0	5.2	5.1	8.5	7.1
Total cream and butter.....	85.1	83.1	84.2	84.7	85.5	83.6	83.2	81.3	80.6	79.9
Other 1/.....	.3	.3	.2	.4	1.5	1.0	.3	.3	.2	.1
Total butterfat, upstate plants.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
New York City plants:										
Liquid whole milk.....	.6	.4	.4	.6	.5	.4	.4	.3	.3	.3
Condensed whole milk.....	6.1	12.5	19.0	21.8	22.4	26.0	29.3	31.2	33.6	29.9
Total whole milk.....	6.7	12.9	19.4	22.4	22.9	26.4	29.7	31.5	33.9	30.2
Cream.....	41.4	59.5	64.0	45.0	56.0	59.4	57.0	51.3	50.7	41.1
Butter.....	51.9	27.4	16.6	32.6	19.3	13.3	13.1	17.0	15.0	28.4
Total cream and butter.....	93.3	86.9	80.6	77.6	75.3	72.7	70.1	68.3	65.7	69.5
Other 1/.....	.0	.2	.0	.0	1.8	.9	.2	.2	.4	.3
Total butterfat, New York City plants:	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
SOLIDS-NOT-FAT INGREDIENTS										
All New York State plants:										
Condensed skim milk.....	n.a.	36.7	33.6	33.0	32.0	29.2	32.5	34.2	36.1	38.3
Nonfat dry milk.....	n.a.	10.9	9.7	10.3	10.8	10.9	11.7	8.5	10.0	9.5
Liquid skim milk.....	n.a.	4.4	3.9	3.5	3.2	4.1	3.8	4.1	3.2	3.0
Total skim milk.....	n.a.	52.0	47.2	46.8	46.0	44.2	48.0	46.8	49.3	50.8
Condensed whole milk.....	n.a.	25.9	31.9	34.9	28.9	31.4	30.9	33.0	32.2	31.4
Dry whole milk.....	n.a.	.6	.4	.5	5.3	5.7	3.1	2.7	2.9	2.5
Liquid whole milk.....	n.a.	10.2	9.6	8.6	8.9	8.7	8.1	7.9	7.3	7.5
Total whole milk.....	n.a.	36.7	41.9	44.0	43.1	45.8	42.1	43.6	42.4	41.4
Cream.....	n.a.	11.0	10.7	8.9	10.6	9.9	9.8	9.4	8.1	7.6
Total whole milk and cream.....	n.a.	47.7	52.6	52.9	53.7	55.7	51.9	53.0	50.5	49.0
Other 1/.....	n.a.	.3	.2	.3	.3	.1	.1	.2	.2	.2
Total solids-not-fat.....	n.a.	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1/ Includes dry whole milk and dry buttermilk.										
Computed from reports of the New York State Department of Agriculture.										

Table 7.--Coefficients of simple correlation between usage of specified ingredients of ice cream mix and changes in cost of fat, New York State, 1949-57

Ingredient	Location of plants	Cost of fat in specified ingredient relative to--			
		Cost of single alternative			Average cost of both alternatives
		Butter	Whole milk	Cream	
Cream . . .	New York City	-.54	-.31	---	-.49
	Upstate New York	<u>1/</u> -.73	-.17	---	-.54
Butter . . .	New York City	---	-.22	-.49	-.42
	Upstate New York	---	<u>1/</u> -.78	-.61	<u>1/</u> -.75
Whole milk	New York City	.54	---	.07	.38
	Upstate New York	-.48	---	-.45	-.60

1/ Significantly different from zero by Fisher's Z test, the probability of a chance occurrence being between 0.01 and 0.05.

Manufacturers varied their use of ingredients supplying solids-not-fat less in response to cost, than they did ingredients supplying fat (table 8). This may have been due to the greater importance of fat ingredients, in terms of their cost, and to the fact that some of the ingredients supplying fat (whole milk or condensed whole milk) also supplied substantial quantities of solids-not-fat.

SURVEY OF INDIVIDUAL FIRMS

Information about factors other than margins that influence the utilization of Class III milk was obtained by interviewing officials of 38 firms in the New York-New Jersey milkshed. Twenty-nine of these firms processed Class III milk into manufactured dairy products. They used 527 million pounds of milk for making Class III products in June of 1956. 5/ One firm did not operate plants, but did a brokerage business in Class III products; its responses in the interview were grouped with those of the firms processing Class III milk. Six specialized ice cream plants and two candy manufacturers were included to reflect the views of users of products of Class III milk. These users did not themselves process appreciable quantities of milk as milk.

The 29 firms processing Class III milk included nearly all of the firms that operated two or more dairy manufacturing plants in the milkshed, and seven of the one-plant firms (table 9). The smaller firms were not chosen at random, but on the basis of available information about their operations. While such information was not complete, it usually indicated that a given firm was representative of a certain type of operation, or had other characteristics that made it desirable for analysis.

5/ The quantity of milk used for making Class III products is a measure of the size or importance of firms having given characteristics. Special tabulations were required for this purpose, and data for June 1956 were the most recent data available when this stage of the analysis was started.

Table 8.--Coefficients of simple correlation between usage of specified ingredients of ice cream mix and changes in cost of solids-not-fat, New York State, 1949-57

Ingredient	Cost of solids-not-fat in specified ingredient relative to--			Average cost of both alternatives
	Cost of single alternative			
	Condensed skim milk	Nonfat dry milk	Skim milk	
Nonfat dry milk	-.33	---	.11	-.22
Condensed skim milk	---	.13	-.26	-.12
Skim milk	-.32	-.31	---	-.26

Table 9.--Firms manufacturing dairy products in the New York-New Jersey milkshed: All firms, firms interviewed, and quantity of Class III milk processed by all firms and by firms interviewed, by size of firm, June 1956 ^{1/}

Size of firm	Firms		Quantity of Class III milk handled, June 1956	
	Total ^{2/}	Interviewed	By all firms	By firms interviewed
	No.	No.	Mil. lb.	Mil. lb.
4 or more manufacturing plants each	9	8	275	263
2 or 3 manufacturing plants each	14	14	224	224
1 manufacturing plant each	256	7	317	40
Total	279	29	816	527

^{1/} Excludes nonpool plants outside New York State.

^{2/} Class III Milk in the New York Milkshed (2, p. 18).

The seven single-plant firms surveyed accounted for about 27 percent of the pool milk in Class III used by firms of this size during June 1956. In total, the firms interviewed represented more than 75 percent of the total volume of pool milk used for Class III purposes.

Interest in Different Classes of Use

By almost any characteristic one may use in describing them, the 30 firms that were interviewed about their use of Class III milk represent an almost continuous range of variation with no conspicuous groups. It is convenient to classify them in groups, but many of the firms might be classified differently by different observers. The main groups into which these firms fall, however, were clear enough to indicate some important features of the market for Class III milk. The characteristics considered were relative interest in different classes of use, geographic extent of the

sales areas, preferences among Class III products, nature of sales commitments, commitments for milk supplies, labor supply, approvals by health agencies, and pool status.

One of the most important characteristics of these firms appeared to be their relative interest in Class I and Class II milk, contrasted with Class III milk. Those mainly interested in fluid uses tended to view the Class III products differently than did the firms which were mainly interested in Class III milk. In 14 firms, manufacturing was the sole or primary activity. To these firms, the handling of Class III milk was not merely a way of assuring adequate supplies of milk for fluid uses at the lowest possible cost. Rather, it was to them a supply of milk that could be made into manufactured dairy products with a reasonable prospect of profit from the operation. The opportunity arose in part, at least, from the willingness of some firms to sell milk for Class III uses at less than normal handling charges over the Class III price to producers. The 14 firms handled 224 million pounds of milk for manufacture in June 1956.

Fluid use (Class I and Class II) was the primary goal or activity of 16 firms, 9 of which had relatively small-scale manufacturing enterprises, in which they used any milk not needed for fluid sales. These 9 firms handled 55 million pounds of milk for manufacturing in June 1956. The other seven firms had large quantities of Class III milk, and large volume, specialized manufacturing plants which could be relatively efficient in manufacturing dairy products. They handled 198 million pounds of milk for manufacturing in June 1956.

The relationship between fluid use and manufacturing has a special significance for companies whose operations are nationwide. Five such companies processed Class III milk in the New York milkshed. Two of them had extensive fluid milk operations. Such companies were organized into subsidiary companies or divisions in which short-run operating decisions (day-to-day, month-to-month, and even season-to-season) were largely within the control of the division managers. Longer run decisions were more likely to be made in the national headquarters of the company--such, for example, as selecting regions in which to locate new facilities. The 5 firms operated 11 divisions and subsidiaries in the New York-New Jersey milkshed, and for most analyses in this report each division was treated as a separate "firm."

Over the past several decades these companies have tended to shift their manufacturing activities from the Northeast to the Midwest and South. Manufacturing now plays a different role in the operations of these concerns in the New York milkshed than it did 30 years ago. It was apparent in discussions with officials of these companies that their plans include the possibility that manufacturing operations in the New York-New Jersey milkshed may become less profitable.

In the following discussion, differences among firms in the classes of use in which their interest lies and the geographic scope of their operations will be referred to as they bear on other factors which influence Class III utilization.

Sales Areas of Processors and Users

Manufacturing operations of processor firms in the milkshed other than the five national firms referred to above may also be influenced by geographic factors. Most of the other processing firms have sales areas that extend beyond the marketing area as defined in the New York-New Jersey order, or even beyond the milkshed. Out of 27 such firms furnishing information about the size of their sales areas, 10 had sales

in New England States other than Connecticut, 6 reached into the South Atlantic Region (some as far as Florida), and 4 had sales in the East North Central Region.

Among the users of Class III milk products were candy companies that were large firms with nationwide or even international distribution and ice cream companies that tended to be among the larger firms in the ice cream industry. The sales areas of many of the individual ice cream firms were much broader than the marketing area of Federal Order 27, but within the boundaries of New York, New Jersey, Pennsylvania, and Connecticut.

Firms with wide geographic sales areas have broader contacts with supplies of milk from outside sources than if they confine their sales to the marketing area. A higher price for New York Class III milk would decrease the size of the area in which New York pool milk would have a competitive advantage.

Principal Type of Distribution for Class III Products

The firms interviewed differed in the types of market outlets and the types of merchandising programs which they used most for their Class III products (table 10). One group of firms centered its efforts on selling products carrying the firms' brands, supporting this effort with extensive advertising to win consumer acceptance, and distributing their own products. Another group of firms also had a distribution system as a means of maintaining outlets, but it relied heavily on moving Class III supplies through wholesale channels to other distributing firms. A third group moved most of its output of Class III products to large wholesale buyers for further processing or distribution.

Processors' Preferences Among Class III Products

Among the products made from Class III milk, a few evidently had a preferred position. This was to be expected from the study of margins (5, pp. 34-40). Officials of processing firms were asked in this study which products their firms would expand if they had the opportunity. About half the firms favored one or more of three products: Cream, ice cream mix, and ice cream (table 11). Cottage cheese led as a preferred outlet for skim milk. Several firms named Italian cheese, also, as a preferred product.

Table 10.--Principal type of distribution used and volume of Class III milk handled by 30 firms that processed Class III milk, New York-New Jersey milkshed

Principal type of distribution	Number of firms	Volume of Class III milk handled by these firms in June 1956 Million pounds
Own distribution	8	209
Own distribution and wholesale outlets	8	104
Large-scale wholesale outlets	13	214

Table 11.--Preferred products and volume of Class III milk handled by firms that wished to increase sales of Class III products

Preferred product	Number of firms 1/	Volume of Class III milk handled by these firms in June 1956
		Million pounds
Cream	7	45
Ice cream mix	6	141
Ice cream	4	73
Cottage cheese	4	103
Italian cheese	3	50
Consumer packaged products or full line 2/ . . .	5	170
Other products 3/	7	112
No preference stated or question not relevant . .	4	39

1/ Some firms reported more than one preference.

2/ "Consumer packaged products" are products packed in small packages for sale to consumers.

3/ Included five other products or classes of products.

Some of the firms would not express a preference among the Class III products. Some firms marketed a complete line of branded products; other companies preferred to reduce rather than expand their Class III volume.

Companies covered in the study were asked about the adjustments that they would make if sales of the preferred product could be increased. About one-fourth of the firms said that expanded sales of any of their products would be followed by efforts to enlarge the supply of milk (table 12). Most of the firms that anticipated adjusting their supplies were firms distributing branded products. They appeared to expect that increasing their supply of milk would add to costs--buying from plants that charged more for handling, hauling milk from more distant plants, or soliciting producers directly--but that the margins for the preferred products would be wide enough to cover some added cost for raw materials.

Table 12.--Adjustments which firms would make if sales of preferred products were expanded and volume of Class III milk handled by these firms

Adjustment expected	Number of firms 1/	Volume of Class III milk handled by these firms in June 1956
		Million pounds
Procure more milk or more of the product . . .	8	175
Decrease butter output	7	91
Decrease nonfat dry milk output	7	120
Decrease output of other products	4	134
No reply	8	86

1/ Some firms reported more than one adjustment.

Most of the firms said they would decrease the production of one or more products--butter and nonfat dry milk were most frequently mentioned.

Since most of the firms had products the output of which they would willingly restrict if the milk were needed for other uses, the respondents were asked what other factors might limit the sales of the preferred products. Competition was most frequently given as the answer, and closely related to this, problems of winning consumer preference (table 13). Some mentioned supply as a limiting factor, particularly the need of having sufficient quantities at all seasons to meet commitments.

Processors' attitudes on this whole subject of preferred products--their choice of preferred product, their adjustments should the sales of the preferred product be increased, and the factors which they considered to be limiting their sales of the preferred products--seemed to be related to the type of distribution which the company had adopted (table 14).

Several firms whose primary outlet was their own distribution of advertised brands preferred to expand sales of products in consumer packages. These firms accounted for more than half of the Class III milk handled by firms with this type of distribution. Firms using mainly large-scale wholesale outlets, on the other hand, expressed a preference for expanding their sales of cream, ice cream, or ice cream mix.

As might be expected, firms emphasizing their own distribution of advertised brands felt consumer preference to be one of the most important factors limiting their sales. Firms using mainly large-scale wholesale outlets most frequently said that their sales could be increased only by selling at lower prices than their competitors. Competitors were likely to match the price cuts, or even to take the lead, and lower margins were sure to result whether or not sales increased.

Should sales increase, the response of firms emphasizing their own distribution of advertised brands would be predominantly to procure more milk, while the other firms would increase supplies of the preferred product by restricting output of some less favored product.

Sales Commitments

The kind of market outlet chosen by firms manufacturing Class III milk had some effect on their freedom to choose among products (in both type of product and quantities produced) and on their flexibility in responding to fluctuating market price relationships. This is only one of several types of market characteristics that might tend to dampen short-run responses to changes in margins. The firms were asked how much sales under contract affected the marketing of Class III products. A little more than one-third of the firms indicated that they sold some of their output under sales contracts. Quantities involved generally were small, and the contracts tended to be quite informal.

Throughout the interviews, respondents' discussion of their decision-making methods and practices indicated that they were influenced by some sales commitments that were not formal enough to be considered contracts. Despite their informality, such commitments bound the firm rather firmly to a predetermined pattern of production for weeks or months or longer. This was often brought out when the respondent referred to something which the firm was doing "to meet our customer commitments," or when he said that the firm's choice of products was influenced by "customer

Table 13.--Factors tending to limit sales of preferred products and volume of Class III milk handled by firms reporting these factors

Limiting factor	Number of firms 1/	Volume of Class III milk handled by these firms in June 1956 Million pounds
Competition in selling	13	186
Supply of milk	6	117
Consumer preference	5	171
No reply, or question not relevant	10	91

1/ Some firms cited more than one limiting factor.

Table 14.--Relation between type of distribution and possible increase in sales of preferred products

Factor related to expanded sales of the preferred product	Type of distribution emphasized					
	Own distribution		Own distribution and wholesale outlets		Large-scale wholesale outlets	
	No. of firms 1/	Class III volume 2/ Mil. lb.	No. of firms 1/	Class III volume 2/ Mil. lb.	No. of firms 1/	Class III volume 2/ Mil. lb.
Products which firm would prefer to sell more of:						
Cream, ice cream, or ice cream mix	4	72.2	2	12.8	9	157.8
Cottage and Italian cheese	2	52.4	3	62.1	1	19.2
Consumer packaged products or full line:	3	127.1	2	42.6	0	0
Other	2	62.4	1	9.5	4	39.8
Not stated	0	0	2	18.0	1	20.7
Factors limiting sales:						
Competition	3	61.6	4	65.6	6	58.9
Consumer preference:	3	127.1	1	11.0	1	32.9
Supply	1	22.7	1	3.5	4	90.8
Not stated	2	20.6	3	27.3	4	43.3
Adjustments in oper- ations if sales increased:						
Procure more milk	6	155.8	0	0	1	19.2
Restrict butter and nonfat dry milk output	2	53.5	3	51.9	6	36.7
Restrict output of other products	0	0	2	18.8	4	115.2
Not stated	0	0	4	42.5	3	43.0
All firms	8	209	8	104	13	214

1/ Some firms cited more than one factor.

2/ Volume of Class III milk handled by firms in June 1956.

requirements.” A number of respondents stated that a given product would be produced only after a customer had placed an order. More than half of the firms volunteered comments about this type of commitment, although the schedule which was used as a guide during the interviews included no questions about commitments of this sort.

Firms which depended most heavily on large-scale wholesale buyers referred to these informal types of sales commitments more frequently than the firms which had the most control of their own distribution. It would be expected that if any manufacturers in the market depended on open market sales (negotiated lot by lot) it would be those who sold through large buyers. There was price competition in these transactions; yet there tended to be more continuity of relations between seller and buyer than would be expected in an open market.

About half of the respondents mentioned specific products as being subject to some form of market commitment. Cheddar cheese was named most frequently. Next in order were ice cream mix, ice cream, and cream. The latter three products are closely related and might be considered to be a common or single use, in which case the number of firms mentioning commitments for this use would be about twice as great as the number mentioning commitments in connection with Cheddar cheese. Other products whose output was tied to some form of sales commitment included sweetened condensed milk, nonfat dry milk, sour cream, cheese curd (for further processing into Italian cheese), and casein. Nonfat dry milk appeared to be subject to sales commitments when the buyer specified a particular heat treatment in its production.

Commitments for Milk Supplies

Among firms that procured milk directly from producers; more than half acknowledged having some contract with or informal commitment to the producers from whom they bought their milk. In most instances this commitment was between the processor and a cooperative association acting as agent for the producers who delivered their milk directly to the processor's plant. In other instances, the processor was procuring milk directly from, and had contracts or some other continuing understanding with, independent producers. A number of firms professed to have no commitments to their producers. Nevertheless, their problems of getting enough milk were such that producers supplying these firms usually had about as much assurance of a continued outlet as did some of the firms where formal contracts existed. The processors did not consider the contracts to be an absolute assurance of continued supply. Several times respondents referred to the ease with which a farmer could escape a commitment by farming under his son's name.

Typically, contracts and agreements with producers ran for a year, after which they could be terminated on a month's notice by either party. The time for renewal of annual contracts usually came in late winter, although some contracts were renewed in the fall or early winter.

Nearly all the firms interviewed for this study bought some milk from other plants in addition to purchasing directly from producers. Several firms relied exclusively on other plants for their supplies of Class III milk. In general, procuring milk from other plants gave the processing plant some flexibility in its volume of operations.

More than half of the firms acknowledged having some contract or informal

commitment to receive supplies from other plants. These contracts usually were negotiated during the winter and were effective either for a year or for that part of the year during which the seller expected to have a substantial quantity of milk for Class III purposes.

The firm buying milk on contract from other plants expected to benefit from having some assurance of the quantity that would be supplied and the price to be paid. Offsetting this advantage was the charge for handling, which was added to the price that the milk marketing order required to be paid to producers. Handling charges negotiated under year-round contracts tended to approximate the normal costs of the receiving operation. This level of handling charges was higher than some firms processing milk into Class III products felt they could afford to pay. Such firms sometimes bought milk from other plants without entering into any commitments for extended periods of time. They were only interested in buying milk offered on a distress price basis.

Some buyers wanted milk from other plants only during months when production was low. Then the converse of distress price conditions prevailed, and handling charges rose to considerable premiums over the level for year-round supplies. Manufacturers of Class III milk avoided overcommitting themselves on sales to avoid paying the higher handling charges for supplemental milk.

Procurement of milk involved a choice among risks, which differed according to the principal interest of the firm. Manufacturing firms which bought short expected to pick up distress supplies at reduced prices. In buying short, firms that were interested mainly in fluid milk assumed the risk that buying supplemental supplies of milk at higher prices would not entail as much loss as receiving larger quantities of milk that could only be used for Class III purposes during much of the year.

Commitments by Users

The relatively small number of users of Class III products that were interviewed for this study included the extremes with respect to use of commitments in procuring supplies. One firm purchased ingredients for ice cream on an offer and acceptance basis. At the other extreme, some of the users regularly depended on one, two, or three sources and rarely purchased ingredients from any other suppliers. In these instances the commitments were more in the nature of custom or habit than of contracts. The effect, however, was much the same: The lack of price sensitivity on the part of users committed to a limited number of sources tended to dampen the rate at which the market adjusted to changes in prices.

Labor Supply

The seasonal variation in production could be met with parallel adjustments in the labor force. All of the firms apparently found it relatively easy to recruit semi-skilled or unskilled labor that might be needed for handling the seasonal peak output. On the other hand, many of the firms reported that the necessity of maintaining a certain number of key personnel resulted in a slack period during the season of low production. Maintenance jobs that could be put off--painting, repairs, and the like--were commonly done at this season of the year. The principal result of this difficulty in adjusting supplies of labor to supplies of milk was that costs of operation were higher than they would have been if milk supplies had been more even seasonally. One respondent commented that when output reached capacity of equipment for one

product in an 8-hour day, the plant might produce another product rather than increase output of the first product. Even though the normal margin of profit for the second product might be lower than for the first, this operation might be less costly than paying overtime or adding another shift to increase the output of the first product.

In summary, it did not appear that the labor supply situation was of much importance overall in determining what products were to be produced from Class III milk.

Health Approvals

Approvals by health authorities tended to affect operations at a number of plants of some firms. Other firms said definitely that health approvals constituted no problem in utilizing Class III milk nor did they in any way limit the choice of products made.

Firms which had a major interest in the sale of milk for bottling tended to secure and maintain approvals from the sanitary authorities of all the localities to which they hoped to sell this type of milk. Several of the firms had sanitary approvals at a single plant from five or six jurisdictions. They complained of the duplication of inspections and of the numerous and divergent requirements of the different health authorities. Multiple inspections affected both plants and producers. Producers' objections raised a problem in the companies' relations with producers. More important from a marketing point of view, a plant having approvals from several jurisdictions could buy milk only from other plants which had the approvals of all of these same jurisdictions. Many plants, for example, were approved to sell milk only in New York City. Such plants could not find an outlet for any of their distress milk at plants that hoped to maintain their eligibility to sell milk in various parts of New England, New Jersey, or Pennsylvania. This may tend to keep in operation more plants and smaller plants than would operate if there were greater reciprocity among health authorities.

The divisive effect of multiple health approvals may explain some of the movements of milk (among plants) that appear irrational (3, p. 25). Health approvals also may explain some of the complexities involved in balancing supplies and requirements within firms. Some of the firms that were interviewed referred to the practice of trading milk. A firm needing milk in New York City might arrange to acquire this milk from another firm's nearby plant, compensating the second firm by an offsetting transfer of milk at plants located at a distance from the market. While such examples of trading milk were mentioned during the interviews, by far the most common practice was outright purchase and sale of tank lots of milk on the spot market. Spot market transactions might consist of a single tank load of milk, or a specified number of tank loads to be delivered over one or more weeks, or of quantities and periods similar to the seasonal and yearly commitments discussed above (p. 23).

Pool Status

Firms interviewed for this study differed in the pool status of the plants they operated. To be qualified for pool status, the plant must receive milk directly from producers and be inspected and approved by the appropriate health authorities; the milk must meet the sanitary requirements for milk for fluid use in the marketing area; and the plant must be ready to ship milk to the market at any time for use as fluid milk and cream. Most manufacturing plants found it to their advantage to become pool plants, although some plants could remain nonpool and buy all of their milk

from pool plants. The possibility of remaining unregulated and the advantages in so doing were changed substantially by the revision of the milk marketing order and the enlargement of the marketing area in 1957. But some plants continued to operate as nonpool plants using only pool milk at the time of the survey.

Some of the multiple-plant firms had all of their plants in the pool; some had part of their plants in the pool; and some had only nonpool plants. One advantage cited for not being in the pool, so far as using Class III milk was concerned, was that the nonpool plant was not obliged to supply milk for fluid use upon call of the Market Administrator. Another advantage was that a few users of manufactured dairy products preferred to buy from nonpool plants using no pool milk to avoid accounting for use of the product as required by the order.

Competition From Outside the Milkshed

During the interviews the firms were asked to comment on competition of products from nonpool sources. Cream and butter from the Midwest were most commonly cited as outside competitors of products from the New York milkshed. Cream cheese, curd for Italian cheese, and nonfat dry milk also were mentioned as midwestern products competing with supplies from the New York milkshed.

Frequent mention was made also of cream and ice cream mix manufactured from the surplus of another milkshed. The entry of this source of supply apparently had disrupted a number of long-established buyer-seller relationships. This incident indicated that the market was sensitive to price at some level despite the importance of commitments, formal or informal, which tended to restrict short-run flexibility of output.

Anticipated Responses to Higher Class III Prices

The question of competition from nonpool sources was approached indirectly by asking respondents what action they thought they would take if the level of Class III prices were raised. No specific raise was suggested; the amount should be considered as one to which the respondent could not remain indifferent. One respondent mentioned the possibility of turning to nonfat dry milk as a source of nonfat solids for chocolate milk and cottage cheese. Others said that they would be forced to make more distress sales of milk for Class III purposes. Still another firm would drop its pool supplies of milk. Some of the larger firms having operations both in the East and elsewhere in the country, would decrease their manufacturing operations in the New York milkshed. One firm, which now confines itself solely to Class III operations, said that a rise in the Class III price would force it to start Class I operations.

In the face of an increase in price, some of the firms could reduce the volume of their Class III operations by adjusting their supplies. They would cancel or not renew their contracts or agreements to purchase milk from other plants.

The ultimate objective of this series of reports is to evaluate effects of changes in the Class III price on the utilization of Class III milk. These effects would come about through decisions of individual firms similar to decisions which, in answer to the hypothetical question, they said they would make. It would be premature to discuss here how much of a change in price would be required to bring about the adjustments in use of Class III milk which these firms predicted. It is appropriate, however, to

mention that in recent years some firms have decreased the scope of their Class III operations, while others have expanded them or, at the time of the interviews, were considering expanding them. Some of the closings of plants went along with a reduction in Class III operations and an increase in Class I, although most of the closings were to increase efficiency of operations by attaining larger volumes in the remaining plants.

Six firms had acquired facilities for processing Class III milk in recent years, and five others said they would like to buy plants. Some of the plants that had been acquired were for making cottage cheese; part of the others were mainly for Class I needs and part for Class III uses other than cottage cheese. Most of the firms wanting to buy plants were already heavily in Class III operations. They wanted plants that were favorably located (for one firm this meant the Midwest) that were receiving substantial volumes of milk, and that were for sale at prices in line with the cost of building such plants. The interest in acquiring plants may result from the difficulty of procuring additional supplies of milk by getting producers to shift from other plants, or the necessity of showing the need for an additional plant before a license to build a new plant could be obtained.

Implications of the Survey Results

It was evident from this survey that manufacturing plants encounter potent resistance to shifting Class III milk among alternative uses. Most firms had one or more Class III products of which they would like to sell more. The order of preference corresponded approximately to the ranking indicated by the net margins calculated in an earlier report (4). Selling more meant, chiefly, finding additional buyers for the preferred products. But the number of buyers was limited, and they were inclined to continue with accustomed suppliers. While interested in prices, they tended to shift among sources only at infrequent intervals and to form new supply alignments only for extended periods. In this situation, sellers' production schedules were geared to sales commitments, formal or informal. Even the sellers' procurement of supplies of milk for manufacturing often was based on their sales commitments. The annual pattern of Class III utilization appeared to be most flexible in late winter as ice cream manufacturers began to plan for their season of peak sales, and processors of Class III milk began to plan for the months when supplies of milk would be largest.

In general, these features of the market tended to predetermine the utilization of Class III milk and to prescribe limits to a manufacturer's willingness to shift milk from one product to another in response to changes in profitability within seasons. Over the longer run, however, costs and prices tended to influence the number, capacity, and location of plants for processing Class III products and the pattern of Class III utilization.

LITERATURE CITED

- (1) Bressler, R. G.
1958. Pricing Raw Product in Complex Milk Markets. U. S. Dept. Agr. Agr. Econ. Res. 10(4): 113-130, illus.
- (2) Clarke, D. A., Jr., McAllister, C. E., and Agnew, Donald B.
1960. Class III Milk in the New York Milkshed. II--An Economic Description of the Manufactured Dairy Products Industry. U. S. Dept. Agr. Mktg. Res. Rpt. 396, 28 pp., illus.
- (3) Cobb, Fields W., Jr., and Clarke, D. A., Jr.
1960. Class III Milk in the New York Milkshed. I--Manufacturing Operations. U. S. Dept. Agr. Mktg. Res. Rpt. 379, 36 pp., illus.
- (4) Luke, H. Alan.
1950. Utilization and Pricing of Milk Under the New York Milk Marketing Order. Cornell Agr. Expt. Sta. Bul. 866, 124 pp., illus.
- (5) McAllister, C. E., and Clarke, D. A., Jr.
1960. Class III Milk in the New York Milkshed. IV--Processing Margins for Manufactured Dairy Products. U. S. Dept. Agr. Mktg. Res. Rpt. 419, 102 pp., illus.
- (6) March, Robert W., and Herrmann, Louis F.
1953. The Establishment of Central Market Butter Prices in Chicago and New York. U. S. Dept. Agr., Mktg. Res. Rpt. 53, 86 pp., illus.
- (7) Owens, T. R., and Clarke, D. A., Jr.
1960. Class III Milk in the New York Milkshed. III--Costs of Manufacturing Dairy Products. U. S. Dept. Agr. Mktg. Res. Rpt. 400, 57 pp., illus.
- (8) Shiskin, Julius.
1958. Decomposition of Economic Time Series. Science 128 (3338): 1539-1546, illus. Dec. 15.



Growth Through Agricultural Progress

